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RESISTANCE OF DIFFERENT COMMON BEAN GENOTYPES (*Phaseolus vulgaris* L.) TO WHITEFLY (*Bemisia tabaci* GENNADIUS, 1889) B BIOTYPE (HEMIPTERA: ALEYRODIDAE)

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INTRODUCTION

The whitefly (*Bemisia tabaci* Gennadius, 1889) B biotype is one of the most harmful pests that attack common bean crops, mainly for extracting large quantities of sap, excreting honeydew that causes sooty mould, and transmitting the bean golden mosaic vírus (BGMV) (Yuki et al., 1998). The disease is the largest constraint to bean production in Latin America and causes significant yield losses (40 to 100%) in South and Central America (Morales, 2006). In the hottest regions of Paraná State (Brazil), in the dry season (sowing from January to April), the BGMV incidence has reached 80 to 100% of plants, with production losses of 30% to 100% (Bianchini et al., 1989). The keeping insect populations below economic threshold levels can be reached with use of resistant cultivars, reducing the need of insecticides (Kavitha and Reddy, 2012). This is an important component of Integrated Pest Management and it is considered as non-monetary input at common bean farmers. This work aimed evaluate the resistance of common bean genotypes to *B. tabaci* B biotype.

MATERIAL AND METHODS

The experiment was carried out in the period from July to August 2016 in a climatized room (temperature of 25 ± 2ºC, relative air humidity of 70 ± 10%, 14h of photophase) at the Agronomic Institute of Paraná (IAPAR), Londrina, Paraná, Brazil. Tubes of 275 ml capacity were filled with commercial substrate (Plantmax®), plus fertilization with the formulation 4-30-10 (N, P_2O5, K_2O) and osmocot (commercial fertilizer). The dose used for both fertilizers was 0.35 g/tube. After that were sow the following common bean genotypes: Arc 1, Raz 49, IAPAR 81, IAC Alvorada, MD Negão, IPR Celeiro, IPR Tangará and IPR Curió. The experimental design was a randomized block with eight treatments (genotypes) and five replicates. Each plot consisted of a tube with a plant. The insects (*B. tabaci*, B biotype) used in the study were obtained from IAPAR collection. Eighteen days after sowing (the genotypes presented phenological stage V3), 40 adults were released on the first trifolium of each plant. These insects were confined within a small cage attached to the leaf surface for a period of 24 hours. This procedure was performed for oviposition on foliar suface. Ten eggs were marked for each infested trifolium, which were monitored daily until the emergence of adults. Mortality and development period (from egg to adult) of insects was recorded. Data were submitted to variance analysis and Scott-Knott test at 5% probability. When the data did not meet the assumptions for parametric analysis, a Friedman analysis ($\alpha = 5\%$) was performed.

RESULTS AND DISCUSSION

The highest percentages of mortality of whitefly nymphs were observed in Arc 1 (44%) and IAC Alvorada (46%), differing from the other genotypes. The highest percentages of mortalities occur in the first and second instars for the genotype Arc 1, and in the third instar for the IAC Alvorada genotype (Table 1). There were no significant differences in the insect

development period among the different genotypes. In this study, this period ranged from 21.5 to 22.2 days (Table 1).

Table 1 - Mortality percentage during nymphal phase and development period from egg to adult in *Bemisia tabaci* B biotype avaluated in differents common bean genotypes under laboratory conditions. Temperature of 25 ± 2ºC, relative air humidity of 70 ± 10%, 14h of photophase. Londrina, Paraná, Brazil, 2016.

Genotypes	Percentage of mortality					Time (days)
	1º instar	2º instar	3º instar	4º instar	Total	Egg-adult
Arc 1	18*	18	4	4	44 a**	22,2 a***
Raz 49	0	0	9	3	12 b	21,6 a
IAPAR 81	0	8	10	4	22 b	22,1 a
IAC Alvorada	10	10	16	10	46 a	22,2 a
MD Negão	2	4	20	2	28 b	21,6 a
IPR Celeiro	2	6	8	0	16 b	21,6 a
IPR Tangará	6	2	2	6	16 b	21,9 a
IPR Curió	4	6	0	0	10 b	21,5 a
CV (%)	-	-	-	-	57,2	2,8
p-value	-	-	-	-	0,03	0,22

CV: Coefficient of variation;
* Mean values: n = 5 for percentage of mortality and n between 22 to 45 for elapsed time from egg to adult.
** Averages followed by the same letter in the column do not differ differ among themselves. Scott-Knott test at 5% probability.
*** Averages followed by the same letter in the column do not differ among themselves. Friedman's test (α = 5%).

Common bean genotypes evaluated showed different levels of resistance to whitefly. These results suggest that the genotypes Arc 1 and IAC Alvorada present some type of resistance (mechanical and /or antibiosis). This resistance is not related to the duration of the egg to adult period, but to the mortality of the whitefly nymphal stage. Torres et al., (2012) also did not verify difference in the whitefly duration life cycle among the IAC Alvorada genotype and the other evaluated genotypes. In relation to the mortality of nymphs, other studies verified resistance of IAC Alvorada and Arc 1 genotypes (Torres et al., 2012; Oriani et al., 2008) with nymphal mortality reaching 96.7% in the cultivar IAC Alvorada and 78% In the Arc 1 genotype. The authors attributed to antibiosis the mortality presented in these genotypes. Future studies evaluating the anatomical and biochemical characteristics of these cultivars can elucidate the mechanism of resistance involved.

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